Section A

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Alpha amylase inhibitory activity and antioxidant potential of different extracts of *Averrhoa carambola* Linn

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The kingdom plantae is a wide resource to search for natural and effective oral hypoglycemic agents that have little or no side effects. In this context,the biological use of *Averrhoa carambola Linn* (star fruit), which is a commonly consumed fruit in the tropics, has been explored. Our previous study demonstrated that the *A. carambola* fruit pulp has a hypoglycemic effect on mammalian systems. In the present study, the alpha amylase inhibitory activity and antioxidant potential of *n*-hexane, ethyl acetate (EtOAc) and water extracts of *A. carambola* fruit were evaluated.

The fruit juice of *A. carambola* was sequentially extracted with *n*-hexane, EtOAc and water. The yields of these extracts were 0.08%, 0.16% and 3.5% for hexane, EtOAc and water, respectively. All extracts were subjected to bioassays to detect pancreatic α-amylase enzyme inhibitory activity, antioxidant activity (DPPH radical scavenging activity) and qualitative phytochemical analysis. All three extracts of *A. carambola* fruit significantly inhibited the α-amylase enzyme activity within the range of 17- 28%, with the hexane extract exhibiting the highest inhibition (28.9%). The overall radical scavenging activity of EtOAc extract was found to be the strongest (71.8%) and the lowest activity shown by the hexane extract (4.9%). Preliminary phytochemical analyses of the extracts indicated the presence of alkaloids, phenols, tannins, flavonoids, diterpenes, terpenoids and fats/oils. The types of phytochemicals of the different extracts were not similar, indicating the variation of polarity of phytochemicals. The EtOAc extract was rich in alkaloids and flavonoids while hexane extract was rich only with fats and oils. Collectively, the *in vitro* assay strongly suggested that not only polar phytochemicals (alkaloids, flavonoids, polyphenols and terpinoids) but also the oils from *A. carambola* are potential alpha amylase inhibitory agents. The observed inhibitions of α-amylase and antioxidant potential suggest that the fruit extracts of *A. carambola* may be useful in the management of diabetesmellitus.Comprehensive phyto-pharmacological investigations are needed to isolate and characterize the exact chemical compounds responsible for amylase inhibitory activityand to understand their exact mechanism of action.

Keywords: *Averrhoa carambola,*alpha amylase inhibitory activity, antioxidant potential, phytochemicals